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09/765,639	01/22/2001	Masahiro Maeda	Q62740	6818

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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
DAY, HERNG DER	

ART UNIT	PAPER NUMBER
2128	

DATE MAILED: 01/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .	Applicant(s)	
	09/765,639	MAEDA, MASAHIRO	
	Examin r	Art Unit	
	Herng-der Day	2128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 September 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 September 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/3/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is in response to Applicant's Amendment ("Amendment") to Office Action dated June 3, 2004, mailed September 3, 2004.

1-1. Claims 13-15 have been added. Claims 1-15 are pending.

1-2. Claims 1-15 have been examined and rejected.

Drawings

2. The proposed drawing corrections to Figs. 1, 2, 3, 4A, 5, 6, 7, and 14 as well as the replacement sheets were received on September 3, 2004. These drawings are acceptable.

3. Fig. 4B is objected to because the 289e appears to contain misspelled word "ASSINGNING". A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application.

Abstract

4. The abstract of the disclosure is objected to because it exceeds 150 words in length. Correction is required. See MPEP § 608.01(b).

Specification

5. The disclosure is objected to because of the following informalities:

Appropriate correction is required.

5-1. It appears that "the attribute information bing in associated with at least one of the design information and the divided area information", as described in lines 5-7 of page 12, should be "the attribute information being in associated with at least one of the design information and the divided area information".

5-2. It appears that the sentence ended in line 5 of page 18 is incomplete.

5-3. It appears that "(reference numeral 210 of Fig. 3)", as described in line 11 of page 26, should be "(reference numeral 210 of Fig. 4A)".

5-4. It appears that "(reference numeral 220 of Fig. 3)", as described in lines 12-13 of page 26, should be "(reference numeral 220 of Fig. 4A)".

5-5. It appears that every "step", as described in lines 3-6 of page 39, should be "means".

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishikawa et al. ("*Ishikawa*"), U.S. Patent 5,836,668 issued November 12, 1998, in view of "Press Release Archive" from Breault Research Organization ("*Breault*"), and further in view of Biermann et al. ("*Biermann*"), U.S. Patent 5,675,495 issued October 7, 1997.

7-1. As regard to claims 1-5 and 13, **Claim 1** is drawn to a method of evaluating the reflection performance of a reflecting mirror designed for a vehicle lamp, comprising the steps of:

a. Entering

- design information representing a plurality of reflecting basic surfaces which constitute the reflecting mirror and
- position information containing a light source position in the vehicle lamp; and

b. displaying attribute information concerning an attribute indicative of whether light from the light source position can effectively reach each of a plurality of areas.

Ishikawa teaches (col. 2, lines 31-56) a method of creating the reflection surface of a reflection mirror of a vehicle lamp, comprising the steps of:

a. setting (entering) basic reflection surfaces and a plural number of paraboloids of revolution with different focal distances, but disposed on a common axis, and forming a reflection surface R of a reflection mirror, and location of light source located at a focal position; and

b. specifying and setting the one of the reflection surfaces having the best incident angle distribution as the final reflection surface and displaying various contours as shown in FIG. 5, FIG. 7, and FIG. 8.

Claim 2 is drawn to displaying attribute information concerning the attribute with respect to each of a plurality of areas into which each of the remaining reflecting basic surfaces is divided on the basis of the design
information (step c).

Ishikawa teaches (col. 2, lines 48-56) calculating angles at which light, emitted from the light source at the focal position, is incident (can effectively reach) on different positions (plurality of areas) on each of the candidate reflection surfaces under design consideration (based

on the restrictive body conditions as well as the distribution of angles at which light is incident on the reflection surface).

Claim 3 is drawn to:

- generating divided area information so as to be associated with the design information, the divided area information being indicative of a plurality of areas, one reflecting basic surface selected from among the plurality of reflecting basic surfaces is divided into the plurality of areas on the basis of the design information (step d);
- determining, on the basis of the divided area information and the design information, as to whether emitted light from the light source position can effectively reach each of the plurality of areas of the selected reflecting basic surface (step e); and
- generating attribute information concerning the attribute assigned to each of the plurality of areas on the basis of the determination, the attribute information being associated with at least one of the design information and the divided area information (step f).

Claim 4 is drawn to sequentially repeating steps d, e and f to each of the remaining reflecting basic surfaces and displaying attribute information concerning the attribute with respect to each of the plurality of areas into which each of the remaining reflecting basic surfaces is divided on the basis of the design information.

Ishikawa teaches (col. 3, lines 35-47) the steps of:

- dividing (generating) each candidate basic reflection surface, under different setting (design) conditions, into different positions (plurality of areas);
- calculating (determining) angles at which light that is emitted from a light source located at the focal position is incident on the different positions (areas) of each of the basic

reflection surfaces under the different settings (design conditions), and evaluating a distribution of the incident angles on each of the candidate basic reflection surfaces; and

- specifying (generating) the candidate basic reflection surface having the best incident angle distribution (attribute information) and setting it as the final basic reflection surface.

Ishikawa further teaches (FIG. 4B and accompanied text) repeating the above steps for each of a plurality of basic reflection surfaces until the evaluation result reaches a preset evaluation level.

Claim 5 is drawn to a method according to claim 2, wherein the step (c) includes the steps of:

- providing an evaluation point to each of the plurality of areas;
- generating a straight line, the straight line connecting the evaluation point to the light source position; and
- making determination as to whether the straight line intersects a reflecting basic surface other than the reflecting basic surface which is associated with the plurality of areas.

Ishikawa teaches (FIG. 1 and accompanied text):

- providing an evaluation point (point F) to each of the plurality of areas;
- generating a straight line (line A) that connects the evaluation point to the position of the light source; and
- judging (making determination) that the incident angle distribution is good "when there are only the contours of equal incident angles that are smaller than a critical incident

angle", which is allowable in securing the visual perception of the lamp within the reflection surface area.

Claim 13 is drawn to a method of claim 1, wherein the plurality of reflecting basic surfaces are discrete surfaces.

Ishikawa discloses the reflection surface R of a reflection mirror has discrete surfaces as shown in FIG. 2B.

Ishikawa does not expressly teach using this method for evaluating the reflection performance of a reflecting mirror designed for a vehicle lamp.

Breault teaches (Extensive New Feature Set Unveiled in ASAP 6.6 press release) ASAP, a professional optical modeling program designed to calculate the performance of fully three-dimensional optical systems that allows engineers to test their optical system by seeing what happens as light moves through the system. ASAP is designed to meet the challenges of virtually any imaging or illumination application. Engineers use ASAP in a wide range of industries including illumination and automotive. Using ASAP enables designers to reduce product-to-market time by simulating optical systems prior to prototyping and manufacturing. *Breault* further discloses (ASAP Module Predicts Illumination System Compliance press release) "New features in the ASAP 6.5 improve ray trace efficiency and allow the user to model coatings without knowledge of the coating prescription. Options in the Display-data Viewer that give the user control over contours, palettes, cursors, and labeling while advanced control options mean many more ways to view and analyze data. And enhancements to the Builder make it even easier to use".

Biermann teaches (col. 1, lines 24-32) that styling and performance requirements now often demand automotive lamps with clear cover glasses. In these lamps, the reflector is the only element used to control the output light distribution and that these lamps may be designed with clear lenses by implementing Free-Form Reflectors (FFR) into the lamp system. A FFR contains mathematically-computed reflector surface that achieve the desired light distribution (also referred to as beam pattern or photometric result) with or without refracting optical elements in front of them. *Biermann* further teaches (col. 1, lines 32-36) that there is a high demand for lamps utilizing FFRS as well as a high demand for reducing design lead-time have created a heavy dependence on lighting design and analysis tools.

It would have been obvious to one of ordinary skills in the art, at the time of the invention, to modify the method of creating reflection surface of a reflection mirror of a vehicle lamp as taught by *Ishikawa* to be used to evaluate the reflection performance of a reflecting surface (mirror) as taught by *Breault* in order to reduce design lead-time as taught by *Biermann*.

7-2. As regard to claims 6-12 and 14-15, **Claim 6** is drawn to a system for evaluating reflection performance of a reflecting mirror designed for a vehicle lamp, comprising:

- a memory;
- a display device to display;
- input means for entering design information and position information on a light source position in the vehicle lamp to store the entered information in the memory, the design information being indicative of a plurality of reflecting basic surfaces which constitute the reflecting mirror; and

- first transmitting means for transmitting, to the display device, attribute information concerning an attribute indicative of whether the emitted light from the light source position can effectively reach each of a plurality of areas, one reflecting basic surface selected from among the reflecting basic surfaces is divided into the plurality of areas on the basis of the design information.

Claim 7 is drawn to second transmitting means for transmitting attribute information concerning an attribute indicative of whether the emitted light from the light source position can effectively reach each of the plurality of areas, each of the remaining reflecting basic surfaces is divided into the plurality of areas on the basis of the design information.

Ishikawa teaches (col. 3, lines 23-27) that the evaluation of the incident angle distribution may be made automatically by processing the calculated values of the incident angles or the contours of equal incident angles by a computer and that (col. 7, line 65 - col. 8, line 2) the process described in FIGs. 3 & 4B may be converted into storable and computer processable form, as would be understood by one of ordinary skill in the ad, and that form may be stored on a readable medium, such as a floppy disk, ROM, RAM or the like. *Ishikawa* further teaches (FIG. 4A and accompanied text) a block illustration of a basic processing system comprising a CPU which has access to a memory for storing data or programs as well a: conventional sources of data and programs, such as a keyboard or floppy disk, via an I/O port. The CPU may have a counter for purposes to be explained and may be connected to a display for providing an operator with information that enables interactive operations.

Claim 8 is drawn to an evaluation system comprising:

- means for generating divided area information;

- means for making determination, on the basis of the divided area information and the design information, as to whether the emitted light from the light source position can effectively reach each area of the selected reflecting basic surface; and
- first attribute means for generating, on the basis of the determination, attribute information concerning the attribute assigned to each of the plurality of areas, the attribute information being associated with at least one of the design information and the divided area information.

Ishikawa teaches (col. 7, line 65 - col. 8, line 2) the process described in FIGs. 3 & 4B may be converted into storable and computer processable form, as would be understood by one of ordinary skill in the ad, and that form may be stored on a readable medium, such as a floppy disk, ROM, RAM or the like.

Claim 9 is drawn to a computer-readable storage medium storing a program to be executed by a computer, the program enabling the computer to evaluate reflection performance of a reflecting mirror designed for a vehicle lamp, wherein the program includes:

- an input process provided so as to enter design information and position information of a light source position in the vehicle lamp, the design information being representative of a plurality of reflecting basic surfaces, the plurality of reflecting basic surfaces constituting the reflecting mirror; and
- a first display process provided so as to display attribute information concerning an attribute indicative of whether the emitted light from the light source position can effectively reach each of a plurality of areas, one reflecting basic surface selected from

among the plurality of reflecting basic surfaces is divided into the plurality of areas on the basis of the design information.

Claim 10 is drawn to the storage medium according to claim 9 wherein the program further comprises a second process provided so as to display attribute information concerning an attribute indicative of whether emitted light from the light source position can effectively reach each of a plurality of areas, each of the remaining reflecting basic surfaces is divided into the plurality of areas on the basis of the design information.

Ishikawa teaches (col. 7, line 65 - col. 8, line 2) the process described in FIGs. 3 & 4B may be converted into storable and computer processable form, as would be understood by one of ordinary skill in the art, and that form may be stored on a readable medium, such as a floppy disk, ROM, RAM or the like.

Claim 11 is drawn to the storage medium according to claim 9, wherein the program further includes:

- a first division process provided so as to generate divided area information, the divided area information including area data on a plurality of areas into which one reflecting basic surface selected from among the reflecting basic surfaces is divided on the basis of the design information, the divided area information being associated with the design information;
- a first determination process provided so as to make determination, on the basis of the divided area information and the design information, as to whether the emitted light from the light source position can electively reach each area of the selected reflecting basic surface; and

- a first attribute process provided so as to generate attribute information concerning the attribute assigned to each of the plurality of a reason the basis of the determination, the attribute information being associated with at least one of the design information and the divided area information.

Claim 12 is drawn to executing the above processes a second time and to a third display process provided so as to display the attribute information concerning the attribute with respect to each of the plurality of areas into which each of the remaining reflecting basic surfaces is divided on the basis of the design information.

Ishikawa teaches (col. 3, lines 35-47) a method, of forming a reflection surface of a reflection mirror of a vehicle headlamp, comprising the steps of:

- dividing (generating) each candidate basic reflection surface, under different setting (design) conditions, into different positions (plurality of areas);
- calculating (determining) angles at which light that is emitted from a light source located at the focal position is incident on the different positions (areas) of each of the basic reflection surfaces under the different settings (design conditions), and evaluating a distribution of the incident angles on each of the candidate basic reflection surfaces; and
- specifying (generating) the candidate basic reflection surface having the best incident angle distribution (attribute information) and setting it as the final basic reflection surface.

Ishikawa also teaches (FIG. 4B and accompanied text) repeating the above steps for each of a plurality of basic reflection surfaces until the evaluation result reaches a preset evaluation level.

Ishikawa further teaches (col. 7, line 65 - col. 8, line 2) that this method may be converted into storable and computer processable form, as would be understood by one of ordinary skill in the art, and that form may be stored on a readable medium, such as a floppy disk, ROM, RAM or the like.

Claim 14 is drawn to a system of claim 6, wherein the plurality of reflecting basic surfaces are discrete surfaces.

Claim 15 is drawn to a computer readable storage medium of claim 9, wherein the plurality of reflecting basic surfaces are discrete surfaces.

Ishikawa discloses the reflection surface R of a reflection mirror has discrete surfaces as shown in FIG. 2B.

Ishikawa does not expressly teach a system for evaluating the reflection performance of a reflecting mirror designed for a vehicle lamp.

Breault teaches (Extensive New Feature Set Unveiled in ASAP 6.6 press release) ASAP, a professional optical modeling program designed to calculate the performance of fully three-dimensional optical systems that allows engineers to test their optical system by seeing what happens as light moves through the system. ASAP is designed to meet the challenges of virtually any imaging or illumination application. Engineers use ASAP in a wide range of industries including illumination and automotive. Using ASAP enables designers to reduce product-to-market time by simulating optical systems prior to prototyping and manufacturing. *Breault* further discloses (ASAP Module Predicts Illumination System Compliance press release) "New features in the ASAP 6.5 improve ray trace efficiency and allow the user to model coatings without knowledge of the coating prescription. Options in the Display-data Viewer that

give the user control over contours, palettes, cursors, and labeling while advanced control options mean many more ways to view and analyze data. And enhancements to the Builder make it even easier to use".

Biermann teaches (col. 1, lines 13-50) that computer assisted design of optical elements is well known in the art and that various computer programs for this purpose are known, these programs typically calculate images or light patterns for optical elements that are mathematically defined; a known technique for such calculation is ray tracing; in accordance with this technique, a program assumes various input light rays, calculates the effect of the optical element on the rays, and displays the resulting light pattern; such a program allows an optical designer to optimize the shape or other optical parameters of the element prior to manufacture of a prototype element.

It would have been obvious to one of ordinary skills in the art, at the time of the invention, to modify the method, i.e., to have the method be converted and implemented into storable and computer processable form, of creating reflection surface of a reflection mirror of a vehicle lamp as taught by *Ishikawa* to be used as a system for evaluating the reflection performance of a reflecting surface (mirror) as taught by *Breault* in order allows an optical designer to optimize the shape or other optical parameters of the element prior to manufacture of a prototype element as taught by *Biermann*.

Applicant's Arguments

8. Applicant argues the following:

(1) "It appears to be the Examiner's position that Ishikawa's basic preliminary set basic reflection surfaces Ro' correspond to the recited 'reflecting basic surfaces which constitute the reflection mirror'" (page 12, paragraph 3, Amendment).

(2) "Ishikawa's preliminary reflection surfaces Ro' cannot correspond to the recited plurality of reflecting basic surfaces" (page 13, paragraph 2, Amendment).

(3) "the combination of Ishikawa and Biermann does not teach or suggest the claimed evaluation system or computer readable storage medium in which the design information represents 'a plurality of reflecting basic surfaces which constitute the mirror'" (page 13, paragraph 4, Amendment).

Response to Arguments

9. Applicant's arguments have been fully considered. They are not persuasive.

9-1. Response to Applicant's arguments (1)-(3). For the purpose of claim examination with the broadest reasonable interpretation, the design information may include Ishikawa's R and Ro'. They represent a plurality of reflecting basic surfaces and the corresponding reflecting mirror.

Conclusion

10. THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Herng-der Day whose telephone number is (571) 272-3777. The Examiner can normally be reached on 9:00 - 17:30.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Jean R. Homere can be reached on (571) 272-3780. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Herng-der Day H.D.
January 13, 2005

Thaiphan
Thai Phan
Patent Examiner
AU: 2128